

**Ontario Ministry of the Environment
Summary Report of Activities to Manage
West Nile Virus 2006**

July, 2007

Protecting our environment.



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Introduction

The Ministry of the Environment (MOE) supports health authorities in managing the risk of West Nile Virus (WNV). MOE provides technical and regulatory expertise to the Ministry of Health and Long-Term Care (MOHLTC), public health officials and other stakeholders on the control of mosquitoes as part of an integrated strategy to control the spread of WNV.

MOE Outreach – Technical Expertise, Public Awareness and Education

A fundamental part of Ontario's WNV program is raising awareness and educating the public about WNV. MOE supported Public Health Units by attending public meetings, participating on provincial advisory committees and responding to requests for information on the use of pesticides from pest control operators, licensed exterminators and the general public. These activities increased awareness of MOE's regulatory requirements for conducting mosquito control programs. MOE visited numerous sites during larvicide application to determine if licensed exterminators were complying with pesticide label directions and permit conditions so that larvicides did not pose a threat to the environment or to human health. Appropriate action was taken to address any concerns identified.

Licences and Permits

An exterminator must hold a valid Mosquito/Biting Flies (MBF) licence and obtain a permit from the MOE to apply larvicides to water for the control of mosquitoes. As of October, 2006 there was a total of 958 active MBF licence holders.

In 2006, MOE authorized only three larvicides for use in managing WNV: *Bacillus thuringiensis israelensis* (*Bti*), *Bacillus sphaericus* (*B. sphaericus*) and methoprene. *Bti* can be applied to ponds, ditches and other stagnant surface water, while *B. sphaericus* can be used for catch basins, surface waters and sewage lagoons. Methoprene can be used in the water contained in curbside catch basins, sewage lagoons and for 2006 in surface water applications.

These larvicides have been extensively reviewed and approved for use by the Pest Management Regulatory Agency (PMRA) of Health Canada. *Bti*, a naturally occurring soil bacterial spore, is a biological larvicide registered in Canada. Safety evaluations of *Bti* application for larval control have shown no risk to wildlife, other non-target species or to human health. *B. sphaericus* is also a bacteria and both products can be used in environmentally sensitive areas (ESAs) since they are unlikely to affect non-target organisms. Methoprene is an insect growth regulator that prevents mosquito larvae from developing into adults and has been used extensively in mosquito control programs. Safety evaluations of methoprene have shown that it does not cause significant risks to wildlife, people, or the environment at levels shown to be effective in preventing mosquito larvae from developing into adults.

In 2006, two new products containing the active ingredient methoprene were federally registered and provincially classified. One product can be used by licensed exterminators under approved permit, while the other is a domestic granular product for application by homeowners to standing waters wholly contained within their property.

The 2006 WNV permit applicant guides were revised, to include an additional use of methoprene for ditches and temporary and permanent pools in 2006 under permit. Other changes include adding newly registered and classified methoprene products and clarifying support documentation and summary report requirements.

In addition, the MOE updated three fact sheets to include the use of methoprene in surface water and the two new methoprene products. The updated permit guides and fact sheets were posted on the ministry's web site.

In Ontario, 22 of 36 health units used larvicides and 336 permits (68 municipal and 268 private property) were issued by MOE. Appendix 1 provides a summary of the 2006 permits.

Monitoring and Scientific Studies

In 2006, MOE continued monitoring of drinking water for methoprene and its metabolites. The number of water treatment plants monitored was increased (43 plants in 2006 vs. 35 plants in 2005) although samples were taken on a less frequent basis. Analytical results showed no presence of methoprene or its metabolites in 2006 samples (detection limit 5ng/L). To date, monitoring through the Drinking Water Surveillance Program has not identified these substances in collected samples.

Surface water was not monitored for methoprene concentrations in 2006 through the Provincial Water Quality Monitoring Network (PWQMN). Past monitoring in 2003, 2004 and 2005 revealed no detectable concentrations of methoprene or its metabolites (detection limit 5ng/L).

A pilot study conducted in partnership with Halton Regional Health Unit was undertaken to determine how long *B. sphaericus* was effective in controlling mosquito larvae in Ontario catch basins. The duration of effectiveness could not be determined due to insufficient larval samples in 2006. The study will continue in 2007.

In 2006 the ministry released a report entitled: *Determining the Efficacy of Methoprene Briquet (2.1% active ingredient) in Preventing Emergence of Adult Mosquitoes in Urban Catch Basins*. This report describes a study that was conducted in 2004 that examined the efficacy of a new methoprene briquet formulation. The results from this preliminary study suggest that the briquet was not entirely effective in controlling mosquitoes for the specified period listed on the label (120-150 days). However, environmental factors, including increased rainfall throughout the summer and leaf litter in the catch basins may have influenced the results of the study. The preliminary study found that the briquet was effective in preventing the emergence of pupae (mosquito life stage before adult) for up to 91 days.

Further work on the effectiveness of methoprene briquets in catch basins was undertaken in 2005. Halton and Peel Health Units, in partnership with MOE, compared the effectiveness of controlling mosquito larvae with methoprene briquets in recently cleaned-out and debris-filled catch basins with untreated controls. Preliminary results released in 2006 showed that methoprene briquets were more effective in inhibiting mosquito emergence in debris-filled catch basins. A final report is being prepared.

MOE continued to examine the risk of WNV related to storm water management ponds (SWM ponds) since these are potential mosquito breeding sites and are often located in urban areas. A multi-jurisdictional working group has done a preliminary review of the data collected from the

monitoring of SWM ponds to support the development of best practice recommendations to reduce the risk of WNV in operating and designing SWM ponds. This work is also guided by reference material obtained from other jurisdictions and in the scientific literature.

Conclusion

The MOE continued to provide regulatory and technical advice on pesticides as part of an integrated mosquito control strategy for WNV in 2006. Regional outreach activities and support provided to health units contributed to an effective and well managed WNV program for Ontario.

Appendix 1
Summary of Permit Data and Larvicide Usage for 2006 West Nile Virus Program

Catch Basin Permit Summary

	No. of Permits Issued*	No. of Permits Used*	Proposed No. of Catch Basins Treated	Actual No. of Catch Basins Treated	Actual Quantity of Methoprene Pellets Used (kg)	Actual Quantity of Methoprene Briquets Used	Actual Quantity of Bti Used (L)	Actual Quantity of <i>B. sphaericus</i> Used (kg)
Municipal	38	34	881835	789978	1525.32	97366	0	568.35
Private	154	151	27742	20712	40.24	2712	0.0077	39.36
ORC**	12	12	472	470	1.64	0	0	0
OPG*¹	1	1	217	217	0.46	0	0	0
MTO	13	12	5385	3140	1.64	2544	0	0
Total	218	210	915651	814517	1569.31	102622	0.0077	607.71

*Permits may include the use of multiple products including *B. sphaericus*

** ORC = Ontario Realty Corporation *¹ OPG = Ontario Power Generation *² MTO = Ontario Ministry of Transportation

Surface Water Permit Summary

	No. of Permits Issued*	No. of Permits Used*	Proposed Size of Treatment Area (ha)	Actual Size of Treatment Area (ha)	Actual Quantity of Aquabac Bti Used (kg)	Actual Quantity of Vectobac Bti Used (kg)	Actual Quantity of Bti Used (L)	Actual Quantity of <i>B. sphaericus</i> Used (kg)	Actual Quantity of Methoprene Granules Used (kg)	Actual Quantity of Methoprene Pellets Used (kg)
Municipal	30	22	1482.83	157.53	1084.05	20.75	411.92	265.25	12.8	0
Private	84	47	229.83	147.39	102.03	206.6	6.28	724	0	7.5
ORC	0	0	0	0	0	0	0	0	0	0
MTO	4	4	23.61	12.22	3	218.7	0	0	0	0
Total	118	73	1736.27	317.14	1189.08	446.05	418.2	989.25	12.8	7.5

* Permits may include the use of multiple products including *B. sphaericus*

** ORC = Ontario Realty Corporation *¹ OPG = Ontario Power Generation *² MTO = Ontario Ministry of Transportation

Appendix 2 - Summary of Methoprene, *Bti* and *B. sphaericus* Use in Municipal Programs by Health Unit

Health Unit/MOE Region	Max. No. of Catch basins (unless noted) treated with Methoprene or <i>B. sphaericus</i>	Area Treated with Methoprene, <i>Bti</i> or <i>B.sphaericus</i> (ha)	Quantity of Methoprene briquettes used in catch basins	No. of Treatments with Methoprene Pellets per Catch basin/ Quantity used (kg)	Quantity <i>B. sphaericus</i> used (kg) in catch basins / surface water	Quantity of <i>Bti</i> Used in catch basins/ surface water (kg unless noted)
Durham Region Health Dept. (CR)	47886	3.47	0	3	0	0
				98.7	0	264.9
Halton Region Health Dept. (CR)	48553	12.59	6851	4	1	0
				107.33	0	107.98
Regional Municipality of Peel Health Dept. (CR)	88853	1.86	2261	3	26.54	0
				230.6	0	27.63
Toronto Public Health (CR)	119758	0.1016	71755	0	480	0
				0	0	1.99
York Region Health Services Dept. (CR)	77378	2.79	1210	4	10.16	0
				212.38	15.92	220.47 L & 4.17 kg
Brant County Health Unit (WCR)	13460	0.483	0	2	0	0
				18.9	18	0
City of Hamilton Public Health & Community Services Dept. (WCR)	38404	67.9	400	4	0	0
				107.8	0	681.5
Haldimand-Norfolk Health Unit (WCR)	6402	0.0025	0	4	0	0
				17.9	0	0.05
Regional of Waterloo Public Health (WCR)	33677	0.736	0	3	7.17	0
				94.1	0.4	7.05

Health Unit/MOE Region	Max. No. of Catch basins (unless noted) treated with Methoprene or <i>B. sphaericus</i>	Area Treated with Methoprene, <i>Bti</i> or <i>B.sphaericus</i> (ha)	Quantity of Methoprene briquettes used in catch basins	No. of Treatments with Methoprene Pellets per Catch basin/ Quantity used (kg)	Quantity <i>B. sphaericus</i> used (kg) in catch basins / surface water	Quantity of <i>Bti</i> Used in catch basins/ surface water (kg unless noted)
Regional Niagara Public Health Dept. (WCR)	44058	0.7	811	4	0.93	0
				118.24	5.23	54.19 L
Wellington-Dufferin- Guelph Health Unit (WCR)	20926	0.82	99	3	0.55	0
				41.7	0.77	104.05 L & 0.76 kg
City of Ottawa Public Health and Long-term Care Branch (ER)	105950	10.98	0	3	0	0
				220.03	0	9.04 L
Hastings and Prince Edward Counties Health Unit (ER)	642	0.07	0	1	0	0
				0.45	0.947	0
Peterborough County-City District Health Unit (ER)	11980	5.743	0	2	0	0
				16.46	0	5.99 L
Chatham-Kent Public Health Services (SWR)	6000	0	600	6	0	0
				0.5	0	0
Elgin St Thomas Health Unit (SWR)	4816	0.38	16	6	0	0
				9.63	0	7.17
County of Lambton Community Health Services Dept. (SWR)	13919	0	0	3	0	0
				33.34	0	0

Health Unit/MOE Region	Max. No. of Catch basins (unless noted) treated with Methoprene or <i>B. sphaericus</i>	Area Treated with Methoprene, <i>Bti</i> or <i>B.sphaericus</i> (ha)	Quantity of Methoprene briquettes used in catch basins	No. of Treatments with Methoprene Pellets per Catch basin/ Quantity used (kg)	Quantity <i>B. sphaericus</i> used (kg) in catch basins / surface water	Quantity of <i>Bti</i> Used in catch basins/ surface water (kg unless noted)
Middlesex-London Health Unit (SWR)	32267	8.42	1012	5	30	0
				85.8 (+ 12.8 kg granules in surface water)	54.39	1.41L & 1.6kg
County of Oxford Dept. of Public Health and Emergency Services (SWR)	9156	0	9156	0	0	0
				0	0	0
Perth District Health Unit (SWR)	6771	0	120	5	12	0
				9.14	0	0
Simcoe County Health Unit (SWR)	17743	0	3075	3	0	0
				17.36	0	0
Windsor-Essex County Health Unit (SWR)	41379	40.48	0	3	0	0
				84.96	169.59	16.77 L
Total	789978	157.53	97366	1525.32 & 12.8kg of methoprene granules	Catch Basin = 568.35	Catch Basin = 0
					Surface Water = 265.25	Surface Water = 1104.8 kg & 411.92 L